KoiGuard

PREVENT A DISASTER FOR YOUR KOI POND

User Manual Main Controller

KOIGUARD KG-MC100
MAIN CONTROLLER

Important! Please read!
This User Manual is an integral part of your purchase and use of this product. It contains important instructions regarding the start-up and use of the KoiGuard pond monitoring system.
Read this user manual carefully! The product's guarantee is no longer valid should the product become damaged as a result of the failure to observe these operating instructions. We do not assume any liability for any resulting damage!
Nor do we assume liability for damage to property or personal injury caused by the improper use or failure to observe the safety instructions for the product. Improper use or failure to follow instructions will invalidate the product guarantee!

KoiGuard
PREVENT A DISASTER FOR YOUR KOI POND

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Introduction

Dear Customer,
Thank you for purchasing this product.
This product meets the requirements of both current national and European standards.
In order to ensure the continued fulfilment of legal requirements and safe operation of this product, we kindly ask you to carefully follow the instructions in this user manual!
All company and product names contained herein are trademarks of their respective owners. All rights reserved.
Should you have any further questions, please contact our technical services department:

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CE

RECYCLABLE PAPER

1. Recommended use

This product, the main controller KG-MC100, is designed for the control of the KoiGuard pond system. It is possible to connect other KoiGuard products (sold separately) to maintain the water quality and other processes in the garden pond, or to control them.

No part of the product may be modified or adapted, otherwise the guarantee/warrantee as well as the licence (CE) will become invalid.
Any use other than the one described above may damage the product and can also increase the risk of short-circuit, fire, electric shock etc.

The main controller is able to run on an Internet connection, or a connection via the mobile telephone network.

Please note:
- Using an external network such as the ones mentioned above can result in additional costs for you.
- Problems with the Internet connection or mobile telephone network are out of our range of influence. For obvious reasons we cannot accept any responsibility for damage caused by a malfunction of these networks.

Take careful note of all the safety instructions in this user manual!

2. Components included

• Main Controller KoiGuard KG-MC100
• Internet / SMS Module KG-WEB001 (optional)
• 5 pieces of clamping terminals for connection with other pond equipment
• User manual

3. Technical specifications and features

• Power supply:	230V~/50Hz
• Power consumption:	approx. 20W
• Breaking capacity per relay:	max. 500VA (230V~/2A)
• Total breaking capacity equipment:	max. 1450VA (230V~/6.3A)
• Protection class:	IP41 / DIN EN60529
• Front keyboard	polycarbonate
• Display	LCD illuminated 4*20 characters

• Clamping terminals for other pond equipment:

-	Water pump	Electrical current monitored
-	Air pump	
-	O_3 generator	
-	UV-C lamp	Electrical current monitored
-	Freshwater valve	
-	2 float switches	

• Alarm contact (voltage-free contact, NO, NC)	Max. 10A / 230V~

• Data storage SD Flash card (optional)	Max. 2Gbyte
• Network connection:	

-	KoiGuard intranet	KoiGuardNET 1.00
		Serial RS-485
-	KoiGuard Ethernet	10Base-T RJ45

4. Safety instructions

The product's guarantee becomes invalid if the product is damaged as a result of the failure to observe these operating instructions. We do not assume any liability for any resulting damage!
Nor do we assume liability for damage to property or personal injury caused by the improper use or failure to observe the safety instructions. In such cases the product's guarantee becomes invalid!

- For safety and licensing (CE) reasons any unauthorised alterations to and/or modification of the product are not permitted.
- The product is designed in accordance with protection class I. Voltage/power may only be supplied via the public power supply (230V~/50Hz).
- This product is not a toy. Devices operated via the supply voltage should be kept out of the reach of children. Therefore, take particular care when children are around.
- Never dismantle the product! There is danger of a fatal electric shock!
- Do not leave packaging material lying around. This may become a dangerous plaything in the hands of children.
- The device is manufactured according to protection class IP41. The product is designed to be used indoors but can be used outdoors when protected from rain and dust.
- The accident-prevention regulations, established by the Employer's Liability Insurance Association for electrical equipment and facilities, must be adhered to in commercial facilities.
- Make sure you only load the product up to the capacity indicated. An overload may lead to the destruction of the device, a fire or an electrical accident.
- Do not use inadequate power cords. These should be sized according to the load to be connected.
- Handle the product with care. Any blow or impact to the product, or if it falls, even a short distance, can contribute to it becoming damaged.
- The approved ambient temperature may not be exceeded during operation (minimum of -20°C and maximum of +55°C)

5. Installation

Before assembling and using the device, make sure you take note of all the safety and assembly instructions in this user manual.
Only people who are appropriately trained are permitted to carry out work on voltage-carrying parts. If you are not properly trained, please consult a qualified electrician who is authorised to carry out such work.
Any incorrect work carried out on the supply voltage may lead to a fatal electric shock. You endanger not only your own life but also the lives of others!

Before we can determine a suitable installation location, we must be sure of:
- a suitable and solid installation location
- no danger for immersion of the housing when the pond floods or leaks

When you have found a suitable installation location, proceed with the installation as follows:
- Disconnect the main controller completely from the supply voltage (all poles)!
- Open the main controller's casing by removing the four screws on the top surface of the device using a suitable screwdriver. Disconnect the flat cable connector of the green pcb on the bottom (Fig. 3.1).

Fig.1 : removing the flat cable connector

- There is one hole in each of the device's four corners.
  You can use a suitable pencil to mark the position of the main controller
  through the four holes in order to drill holes in a wall for inserting dowels, for
  example. The space between the holes is 188 x 88 mm.
- Make sure that the drill holes or screws do not damage any cables, power
  supply lines, gas pipes, or similar! Life-threatening danger!
- Now use the appropriate screws/dowels to attach the controller housing in the desired installation
  location. The openings/plastic cable glands must face downward towards the ground. (fig 1)
- You will find several screw able clamping terminals on the circuit board in the
  main controller's casing. The installation cables are attached to these.

Please note:
The power supply connection in the main controller (2.4) only serves as the power supply for
the main controller. When in operation, hazardous voltage is present on the circuit board!

Fig.2 : external connections

(2.1)   Integral SD flash card holder
(2.2)   Ethernet 10Base-T RJ-45 connection
(2.3)   Cable lead-through M16 for other pond equipment 230V / 50Hz
(2.4)   Cable lead-through M16 for mains 230V / 50Hz
(2.5)   Cable lead-through M12 for 5-12 VDC external communication

Fig3: internal connections
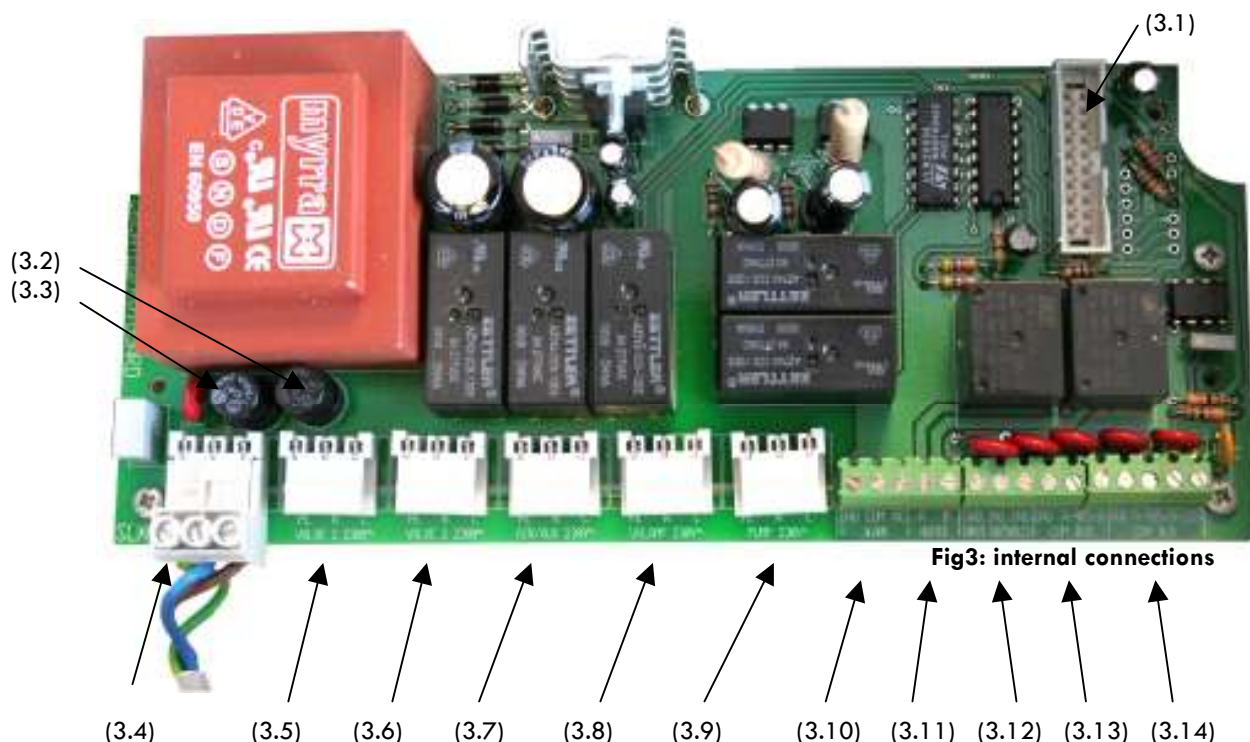
(3.1) Flat cable connector
(3.2) Fuse 6.3A slow for external equipment
(3.3) Fuse 160mA slow for internal equipment

(3.4) 230VAC clamping terminal mains
(3.5) 230VAC clamping terminal VALVE1 230V~ used for the ozone generator
(3.6) 230VAC clamping terminal VALVE2 230V~ used for the fresh water valve
(3.7) 230VAC clamping terminal AIR/AUX 230V~ used for the air pump
(3.8) 230VAC clamping terminal UVLAMP 230V~ used for the UV-C lamp
(3.9) 230VAC clamping terminal PUMP 230V~ used for the main water pump

(3.10) Alarm voltage free contact (NO, COM, NC)
(3.11) voltage free contact for the heating thermostat
(3.12) clamping terminal 2 float switches (GND, IN1, IN2)
(3.13) clamping terminal IN RS_485 KoiGuard for module communication
(3.14) clamping terminal OUT RS_485 KoiGuard for module communication

NOTE: when using clamping terminal IN (3.13) there is no connection for +12 Volt.
        This is only available on clamping terminal OUT (3.14).
        The +12Volt is not used for communication between modules, only for special sensors.

Please also note:
    -    The wiring must be secured properly outside the enclosure, for example using solid mounted wiring
         ducts.
    -    When other external equipment is to be connected to the main controller,
         make sure that the mains is disconnected from the total system.
    -    The alarm voltage-free contact (3.10) is used by the controller to switch on an external alarm device
         when necessary. The alarm contact can switch on a lamp or high output sounder.
    -    To enable the main controller to communicate with the other KoiGuard modules, the required 4 cores
         communication wire must be installed on the clamping terminal RS_485. (3.13 or 3.14)
         This communication wire is available in several lengths. It is possible to connect 2 communication
         wires on each module. For example when the system contains 3 modules, the first cable is fitted to
         the main controller onto the OUT position. (3.14) From the controller to the IN (3.13) position of the
         2nd module. From the OUT position of this module, to the IN position of the 3rd module.

Please note during installation:

GND	=	Green wire
A	=	White wire
B	=	Brown wire
+12V	=	Yellow wire (Not connected for communication between modules)

- Screw the cable lead-through with a spanner, so that the rubber washer closes off the opening.
- Replace the flat cable connector of the green pcb on the bottom. (fig. 3.1)
- Replace the casing cover properly and tighten its screws.
    When using the main controller outdoors, make sure that the cover's rubber seal fits properly in its groove and does not get pinched when you screw on the cover.
- Check again that the cabling is correct.
- Only now may you connect the power cord to the power supply.

5.2   Starting up for the first time

When the main power supply is switched on, after a few seconds a message appears on the main controller screen.

you are asked to enter the serial number and activation code of the Koiguard once. You can find this on the yellow paper, supplied with the Koiguard on purchase.

```
Enter serial/code
>SER. 0004A4000000
 CODE 00000
 Validate
```

- Use the + and – buttons to edit the value at the blinking cursor. (see chapter 6)
- Press the OK button to go to the next position.
- Use the arrow up/down key to the next line.
- When you entered your serial number and activation code, go to 'Validate' and press OK.

- When the combination is ok, the next message appears on the Koiguard Main controller:

```
Serial/code OK!
>Please restart now
```

You must restart the Koiguard by removing the power cord from mains, and connect the power card to the mains again after approx. 10 seconds.

- When the combination is not ok, the next message appears on the Koiguard:

```
Serial/code not OK!
>Please wait...
```

You have to wait a few minutes to enter the serial number and activation code again. Keep the Koiguard switched on. Notice! When you try to enter more wrong activation codes, the wait time will increase!
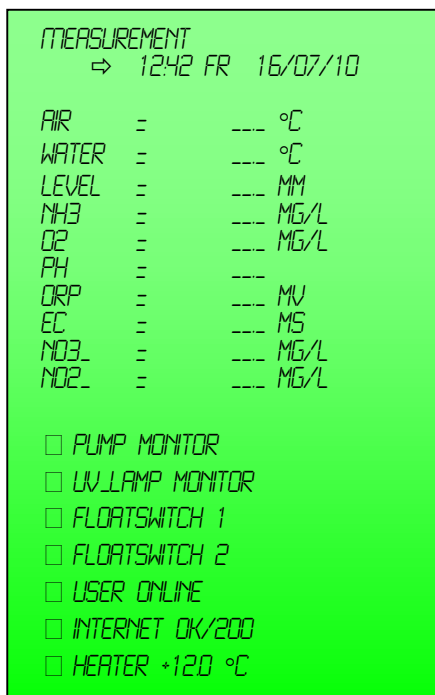
6. Device buttons

(4.1) ———
(4.2) ———

(4.3)
(4.4)
(4.5)
(4.6)
(4.7)
(4.8)

Fig4: front keyboard

(4.9)
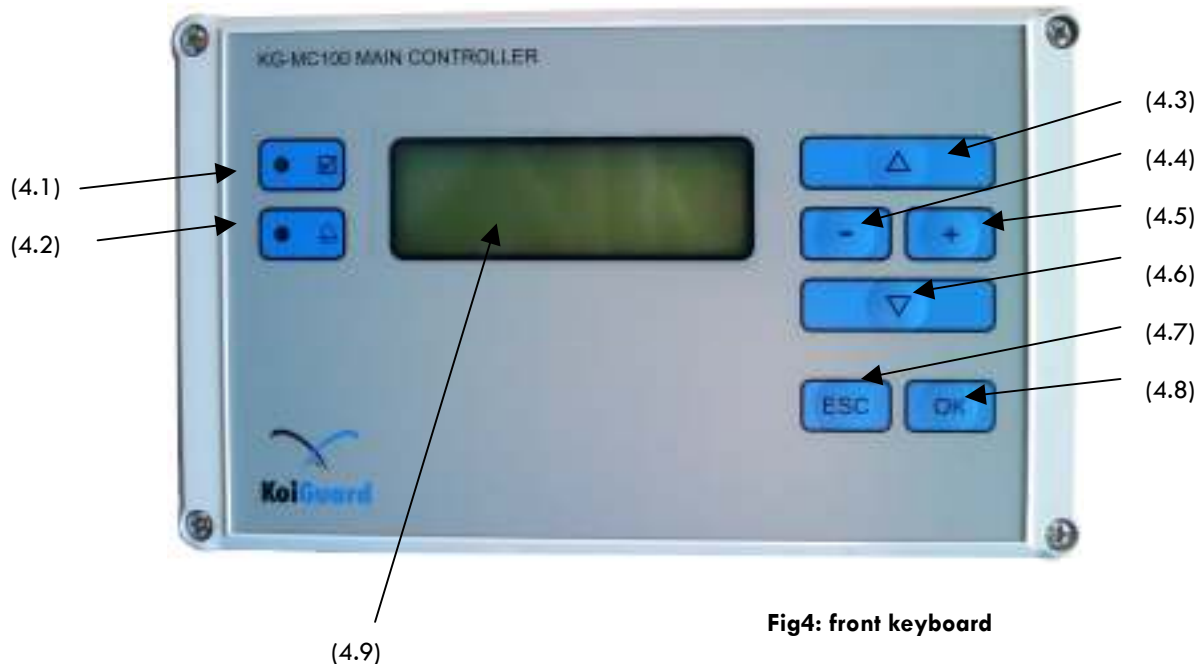
(4.1)   Control lamp ON
(4.2)   Control lamp ALARM
(4.3)   Device button UP
(4.4)   Device button LEFT / MINUS / DECREASE
(4.5)   Device button RIGHT / PLUS / INCREASE
(4.6)   Device button DOWN
(4.7)   Device button ESC / ESCAPE / BACK
(4.8)   Device button OK / CONFIRM
(4.9)   Display window 4 * 20 characters

6.1 Functions of the device buttons

(3)   Device button UP
      Go to the top of the display in the menu. When the underlying lines are no longer visible, the cursor will remain in the same position.

(4)   Device button LEFT / MINUS / DECREASE
      Decreases the present adjusted values of the selected item.
      When the only options are ON or OFF, these settings will be changed.

(5)   Device button RIGHT / PLUS / INCREASE
      Increases the present adjusted values of the selected item.
      When the only options are ON or OFF, these settings will be changed.

(6)   Device button DOWN
      Go to the bottom of the display in the menu. When the underlying lines are no longer visible, the cursor will remain in the same position.

(7)   Device button ESC / ESCAPE / BACK
      One level up in the menu structure. Once you are in the
      home screen, you can switch between the home screen and the
      operating screen.

(8)   Device button OK / CONFIRM
      One level down in the menu structure, or to confirm a setting.

6.2 Explanation of the display.

(6) In the normal operational mode the display shows the current values of all of the sensors and current values.

```
MEASUREMENT
    ⇨ 12:42 FR  16/07/10

AIR      =       _._  °C
WATER    =       _._  °C
LEVEL    =       _._  MM
NH3      =       _._  MG/L
O2       =       _._  MG/L
PH       =       _._
ORP      =       _._  MV
EC       =       _._  MS
NO3_     =       _._  MG/L
NO2_     =       _._  MG/L


☐ PUMP MONITOR

☐ UV_LAMP MONITOR

☐ FLOATSWITCH 1

☐ FLOATSWITCH 2

☐ USER ONLINE

☐ INTERNET OK/200

☐ HEATER +12.0 °C
```

In the MAIN MENU screen, it is possible to change all of the settings for each item. You must press the ESC button (7) to return to the MAIN MENU.

```
Main menu
➔ Measurements
   Alarm
   Control
   Scheduler
   Settings
```
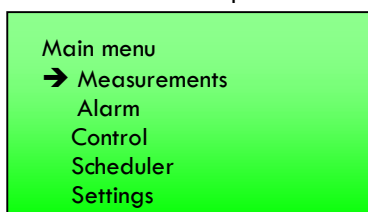
When an arrow appears at the right side of the screen pointing up, it means that more information / settings can be seen when the cursor is moved upwards.

When an arrow appears at the right side of the screen pointing down, it means that more information / settings can be seen when the cursor is moved downwards.
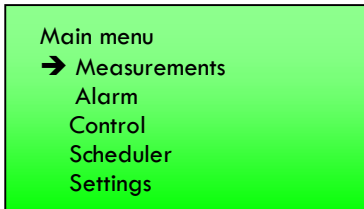
7. MENU structure

The KoiGuard system has been programmed with the next purpose in mind:

Measuring – Managing – Control

The menu has been subdivided into 4 items whereby every item has its own sub items.
Press the ESC (7) button to return to the home screen.

The structure of the menu is the following:

```
Main menu
➔ Measurements
   Alarm
   Control
   Scheduler
   Settings
```

With the device buttons (4.3) and (4.6) it is possible to run through the menu.
The arrow on the left side indicates the current selection. When the optional subjects in the main menu are selected using the OK (4.8) device button, the choice is confirmed.

In the **Measurement** menu (fig. 6.2) all actual and current measurement values and settings of the installed equipment are displayed.
When a sensor is installed, the result of this measurement is automatically displayed in the menu.
The status of installed equipment or the presence of an Internet user in the MyKoiGuard Internet section is indicated by a check box   on the display. If the check box is empty, then the item is not in use.

In the **alarm** menu, the current alarms reports are shown. You are also able to set the minimum and maximum values for each sensor when an alarm must be generated. You may also indicate how an alarm must be communicated, for example by e-mail, SMS or only via the display.

In the menu part **control**, all installed pond equipment can be controlled. You can switch the equipment on or off manually, or you can choose to perform the monitoring of this equipment fully automatically using the KoiGuard system.

Automatic functions such as water changes, heating or controlling the pond filter can controlled via this menu.

The settings of the KoiGuard system for maintenance or the operating system can be selected in the **Settings** menu. Network settings for the Internet and the calibration of the sensors are also available in this menu.

7.1 Measurements MENU

The first line of the measurements menu will show you the time and the date.
When the Main controller is connected to the internet, these data will appear automatically after approx. 1 minute. Next lines are the information of al the sensors, but the last tree lines are special.
These last tree lines:

```
Measurements
   ☐ user online          ^
   ☐ internet ok/205
➔☐ heater +12.0 ˚C
```
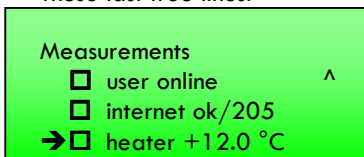
7.1.1 User online

When a user is connected via the MyKoiguard internet page to this Koiguard module, the ☑ box appears.

7.1.2 Internet ok

When the Koiguard module is connected to the internet and adapted by the Koiguard server, the ☑ box appears. This means that the Koiguard module is communicating properly with the server.
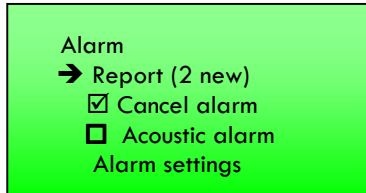
7.1.3 heater +12.0 ˚C

When an electrical heater is installed the ☑ box appears when the heater is running, due to the requested temperature of +12.0 ˚C. For more details of electrical heating see chapter 7.2.2 Control Temperature.
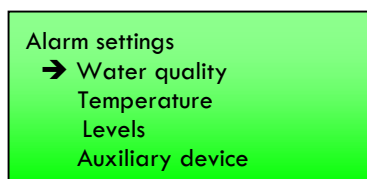
7.2 ALARM MENU

If an alarm report is necessary, it will activate the voltage-free alarm contact (3.10). When and how the alarm report is generated may be set in the alarm menu.

The **Alarm Menu** is divided as follows:

```
Alarm
 ➜ Report (2 new)
    ☑ Cancel alarm
    ☐ Acoustic alarm
    Alarm settings
```

Report	Shows how many unread alarm reports have been generated. When reports have been generated, the number will be displayed. To read these reports, the item must be selected.
Cancel alarm	When the system has generated an alarm which is currently active, it is possible to overrule the alarm. The system stops for this specific disturbance to generate any further alarm reports. When an alarm is generated by another problem or warning it will create a new report.
Acoustic alarm	When the system has generated an alarm which is currently active, it will produce some noise with the internal buzzer for warning.
Alarm settings	All possible adjustments and system settings related to the value of the sensors can be made in this submenu.

```
Alarm settings
 ➜ Water quality
    Temperature
    Levels
    Auxiliary device
```

7.2.1 Alarm Water Quality

```
Water quality
 ➜ pH
    ORP/Redox
    Conductivity
    O2
    NH3
```

```
Alarm settings
    Water quality
       pH
          pH
           ➜ ☑ Report
             ☐ SMS
             ☐ E-mail
             Min:  0.00
             Max: 9.00
```

Minimum/Maximum value for the pH alarm

Adjustable using device button - or +
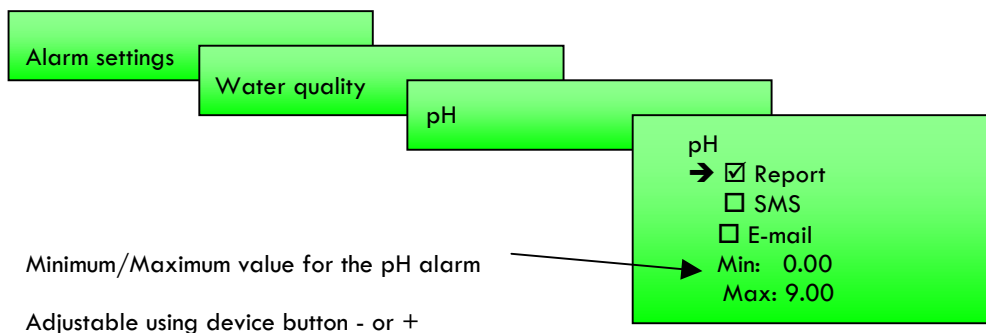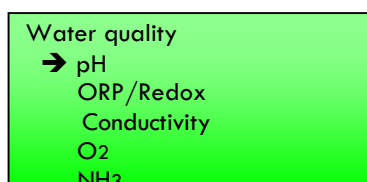
☑ **Report**   When the adjusted minimum or maximum values are being exceeded, the system will generate an alarm report when this item is selected. The control alarm lamp on the front (4.2) will blink as well.

SMS   When the SMS item is selected, the KoiGuard system will send an alarm SMS to the adjusted cell phone number. This number can be adjusted on the MyKoiGuard Internet section. (Only available if the personal amount of SMS credits is not exceeded)

E-Mail   When the e-mail item is selected, the KoiGuard system will send an alarm e-mail to the adjusted e-mail address. This address can be adjusted on the MyKoiGuard Internet section.

We use the same adjustments for all of the other sensor values, such **as ORP/Redox, conductivity** and **oxygen.**

For the NH3 sensor the maximum limits are set to the default values.
These are

```
  NH3
→ ☑ Report
   ☐ SMS
   ☑ E-mail
   Max: 0.20 ppm
   Alert
   Alarm
   Toxic
```

Default limits: Alert max: 0.05 ppm
                   Alarm max: 0.20 ppm
                   Toxic max: 0.50 ppm

When the level for Alarm max : 0.20 ppm must be set,
move the arrow with the ⬇ or ⬆ button to the position and press OK.
The default value of 0.20 ppm is set automatically.

7.2.2 Alarm Temperature

```
Alarm settings
   Temperature
      Water
      Outside
```

```
Water
→ ☑ Report
   ☐ SMS
   ☐ E-mail
   Min:  +5.0 °C
   Max: +25.0 °C
```

```
Outside
→ ☑ Report
   ☐ SMS
   ☐ E-mail
   Min:  +5.0 °C
   Max: +25.0 °C
```

7.2.3 Alarm Water level

Alarm settings

Levels

Water level
Float switch 1
Float switch 2

Water level
→ ☑ Report
  ☐ SMS
  ☐ E-mail
  Min: 0000 mm
  Max: 0900 mm

Minimum/Maximum value pond water level ⟶

Float switch 1
→ ☑ Report
  ☐ SMS
  ☐ E-mail
  Contact

Adjust if the switch is open or closed during
the normal situation. ⟶

Contact
→ ☑ Opened
  ☐ Closed

Float switch 2
→ ☑ Report
  ☐ SMS
  ☐ E-mail
  Contact

Adjust if the switch is open or closed during
the normal situation. ⟶

Contact
→ ☑ Opened
  ☐ Closed

7.2.4 Alarm report auxiliary devices

Just like the water quality values of the pond it's also possible to monitor the status of the installed
Auxiliary devices. In the menu Alarm settings you can adjust the desired alarm report when a failure appears.

Alarm settings

Auxiliary device

→ Pump function
  UV-C function

Pump function
→ ☑ Report
  ☐ SMS
  ☐ E-mail
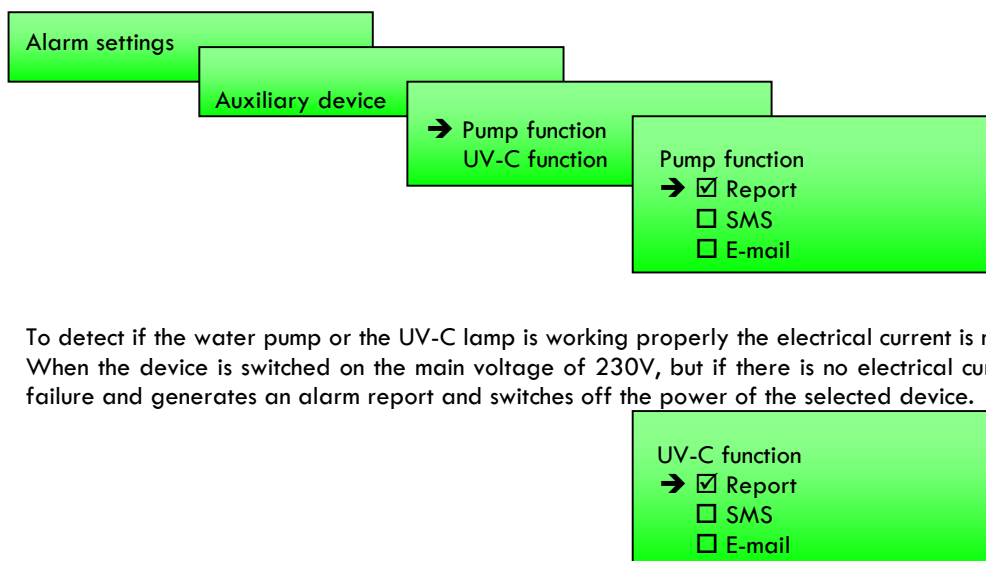
To detect if the water pump or the UV-C lamp is working properly the electrical current is measured.
When the device is switched on the main voltage of 230V, but if there is no electrical current the system detects
failure and generates an alarm report and switches off the power of the selected device.

UV-C function
→ ☑ Report
  ☐ SMS
  ☐ E-mail

7.3 Control menu

In the **Control Menu** all requested values and settings can be adjust for integrated functions.
For example the automatic addition or flushing with freshwater. It's also possible to switch the pond equipment ON or OFF manually.

```
Control
  ➔ Temperature
    Treatment
    Manual
```
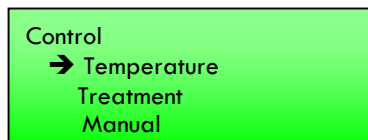
7.3.1 Control Temperature

To heat the water of the pond the system uses a voltage free relays contact, it can be used to switch on a heat exchanger or an electrical heater. Note, an optional power module (KG-POW001) is needed when more 650 Watt is connected.

```
Control

  Temperature
    ➔ Heater

      Heater
        ➔ ☑ Auto
          Temp: +12.0°C      ◄────  Adjustable water temperature
          ☐ Hyst. 0.2 °K     ◄────  A hysteresis of 0.2K gives a more stable
          ☐ Hyst. 0.6 °K            situation, but the heating is switched on
                                    more often.
```
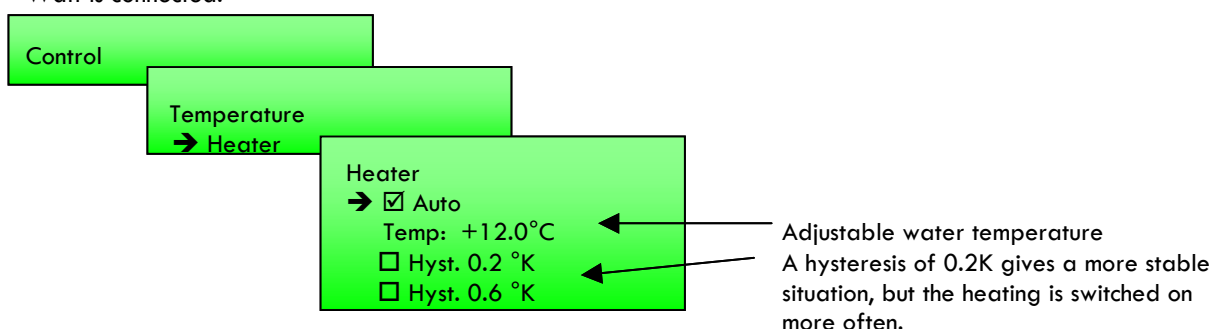
7.3.2 Control treatment

The system provides a function to control other treatment devices witch can be installed nearby the pond.
It is possible to switch the KoiGuard system to automatic after all adjustments are made.

```
Treatment
  ➔ Ozone
    pH+ (pump 1)
    pH- (pump 2)
    Pump turn-off
```
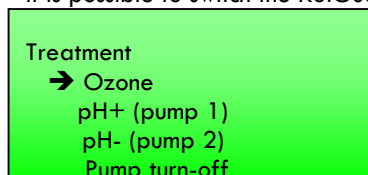
7.3.2.1 Ozone generator

The 230V Ozone generator is directly connected to the main board of the KoiGuard system on position 3.5 VALVE1.

```
Control

  Treatment

    Ozone
      ➔ ☑ Auto
        min ORP < 0300 mV   ◄────  Adjustable minimal and maximal value for
        max ORP > 0400 mV          the ORP level to control the ozone
                                   generator.
```
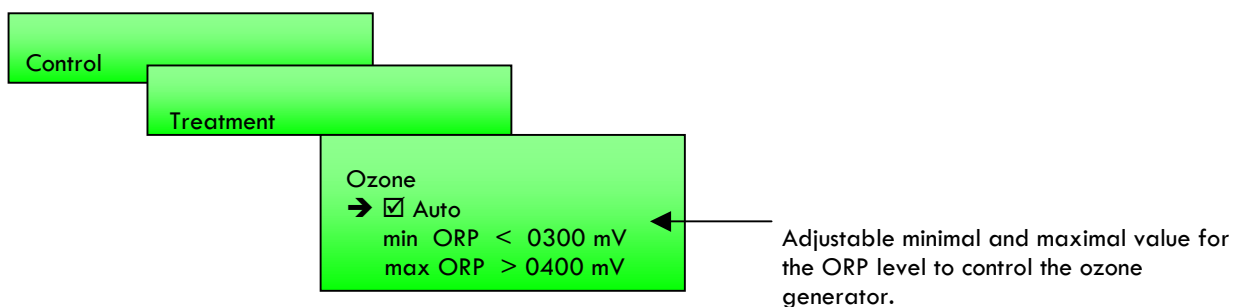
The device is switched on/off by the use of a relays between the adjusted values Min and Max. This value is measured by the Redox sensor.

7.3.2.2 pH regulation

To regulate the level of the pH, 230V peristaltic pumps can be installed and controlled by the Koiguard.
The pumps are connected to the DOSE controller KG-DC100. (Not available in the basic set)

Control

Treatment

pH+ (pump 1)
➜ ☑ Apply
   pH+ start : < 6.0
   pH+ stop : = 6.5

Adjustable minimal and maximal value for the pH+ pump.

PH- (pump 2)
➜ ☑ Apply
   pH- start : > 8.0
   pH- stop : = 7.5

Adjustable minimal and maximal value for the pH- pump.
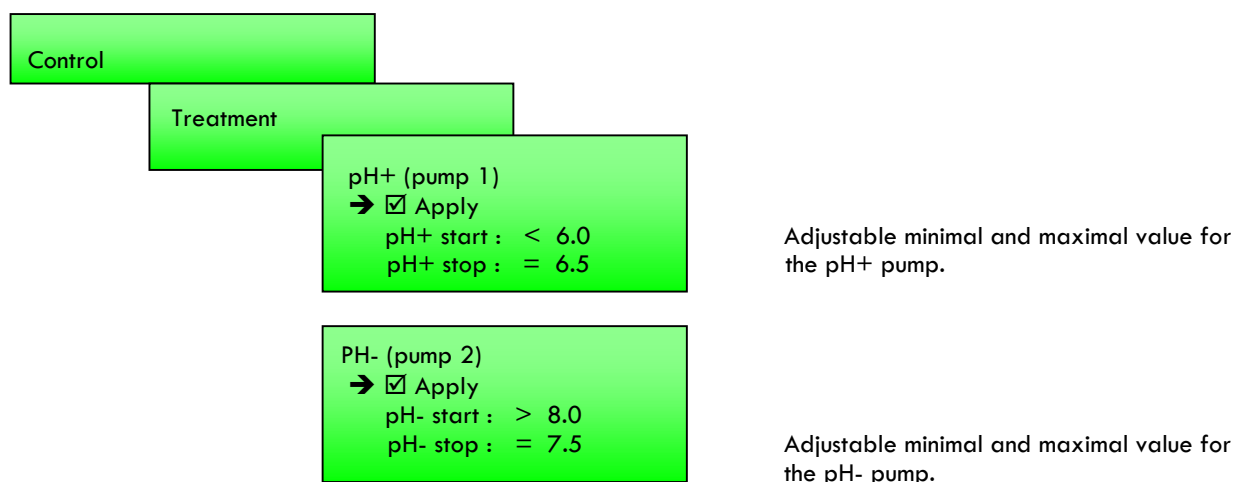
7.3.2.3 Water pump

The 230V water pump is directly connected to the main board of the KoiGuard system on position 3.9.
The pump is prevented for mal function by the measurement of the electrical current of the pump.
If an error appears the pump is switched off. It is also possible to protect the pond for over floating by the use of a floating switch.

Control

Treatment

By the use of the **AND** or the **OR** function, you're able to tell the system to switch the pump off if both floating Switches are activated or just one.

Pump turn-off
➜ Float 1
   Float 2
   ☑ AND
   ☐ OR

Float 1
➜ ☑ Ignore
   ☑ Open
   ☐ Closed

The activation of float switch 2 is ignored.
Float switch 2 is switched off in normal situation.

Float 2
➜ ☑ Ignore
   ☑ Open
   ☐ Closed
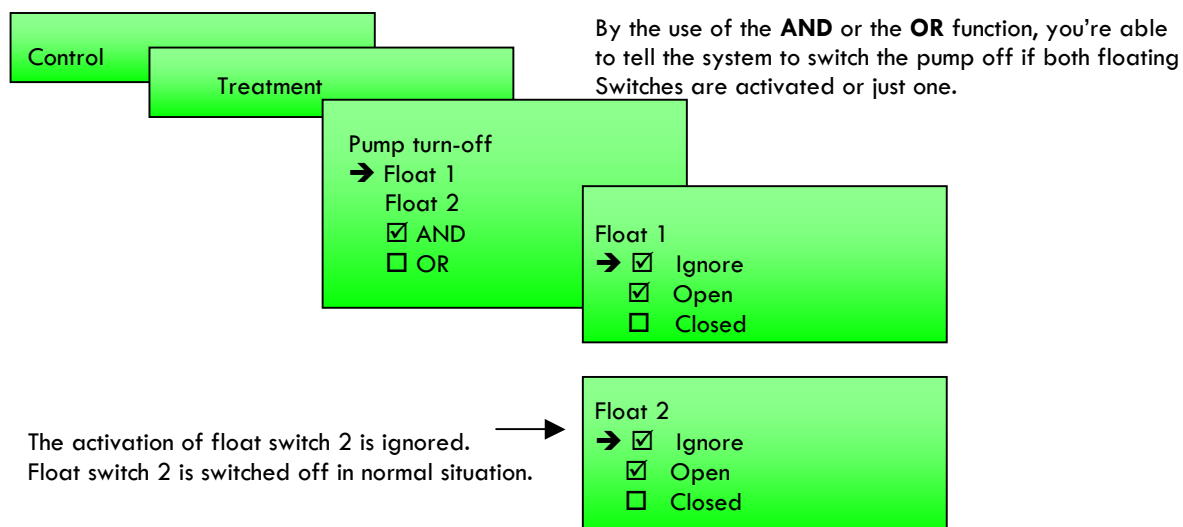
7.3.3 Control Manual

All the installed pond equipment and auxiliary devices can be controlled by the KoiGuard system, or individually controlled manually. This option is required when the selected equipment should be switched on or off immediately.

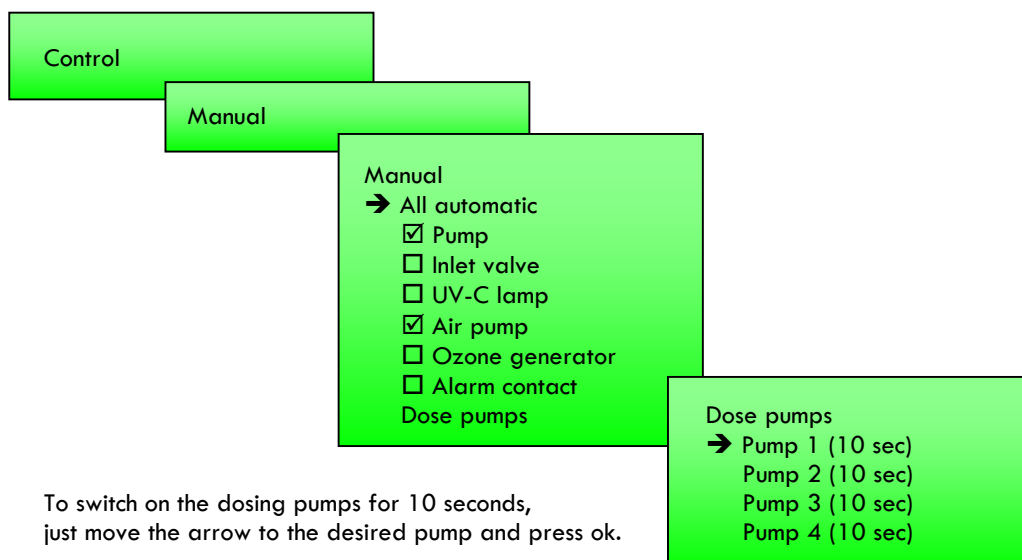In this Menu each item can be switched to :

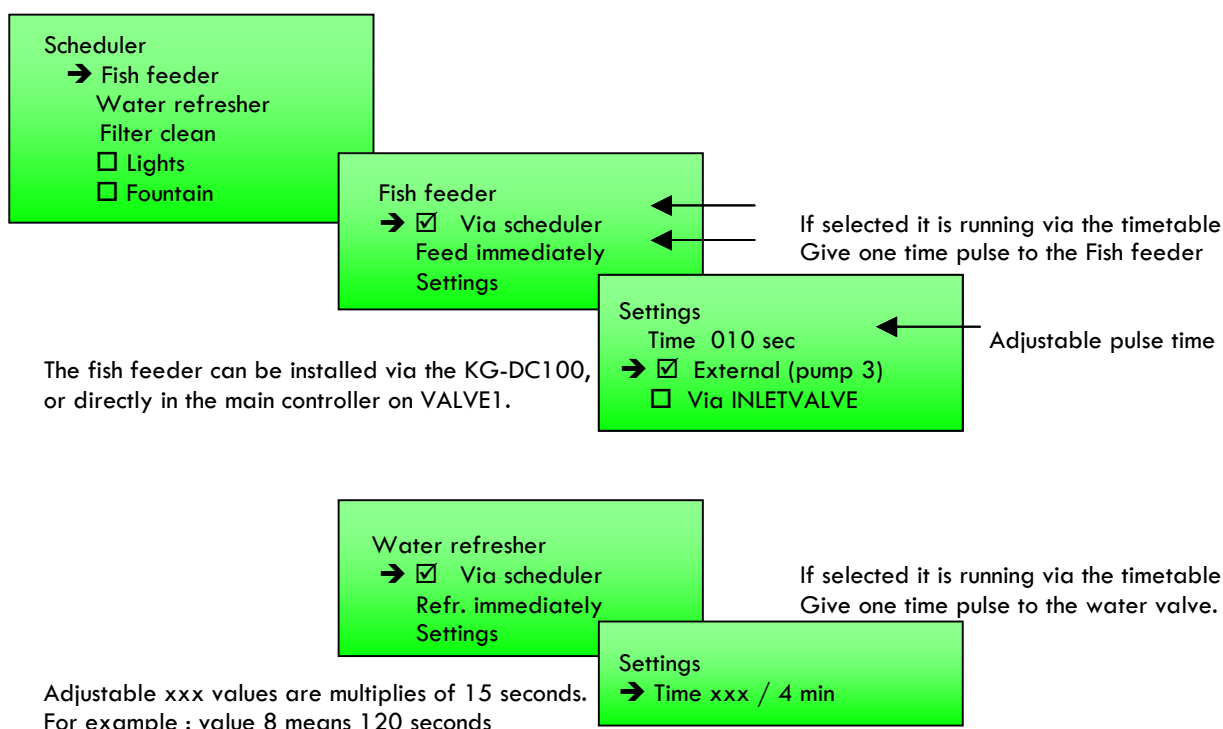 A = automatically. The KoiGuard systems controls the device
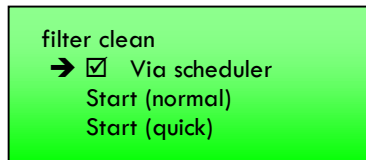 1 = ON. The device is switched on
 0 = OFF. The device is switched off

Control

Manual

Manual
➜ All automatic
 ☑ Pump
 ☐ Inlet valve
 ☐ UV-C lamp
 ☑ Air pump
 ☐ Ozone generator
 ☐ Alarm contact
 Dose pumps

Dose pumps
➜ Pump 1 (10 sec)
 Pump 2 (10 sec)
 Pump 3 (10 sec)
 Pump 4 (10 sec)

To switch on the dosing pumps for 10 seconds,
just move the arrow to the desired pump and press ok.

7.4 Scheduler menu

In the **Scheduler Menu** all the installed devices and equipment can be controlled by the scheduler which is visual on the MyKoiguard web page. This is useful for devices that are time-related and manual control tend to recur.

Scheduler
➜ Fish feeder
 Water refresher
 Filter clean
 ☐ Lights
 ☐ Fountain

Fish feeder
➜ ☑ Via scheduler
 Feed immediately
 Settings

If selected it is running via the timetable
Give one time pulse to the Fish feeder

Settings
 Time 010 sec
➜ ☑ External (pump 3)
 ☐ Via INLETVALVE

Adjustable pulse time

The fish feeder can be installed via the KG-DC100,
or directly in the main controller on VALVE1.

Water refresher
➜ ☑ Via scheduler
 Refr. immediately
 Settings

If selected it is running via the timetable
Give one time pulse to the water valve.

Settings
➜ Time xxx / 4 min

Adjustable xxx values are multiplies of 15 seconds.
For example : value 8 means 120 seconds

```
filter clean
 ➔  ☑   Via scheduler
        Start (normal)
        Start (quick)
```
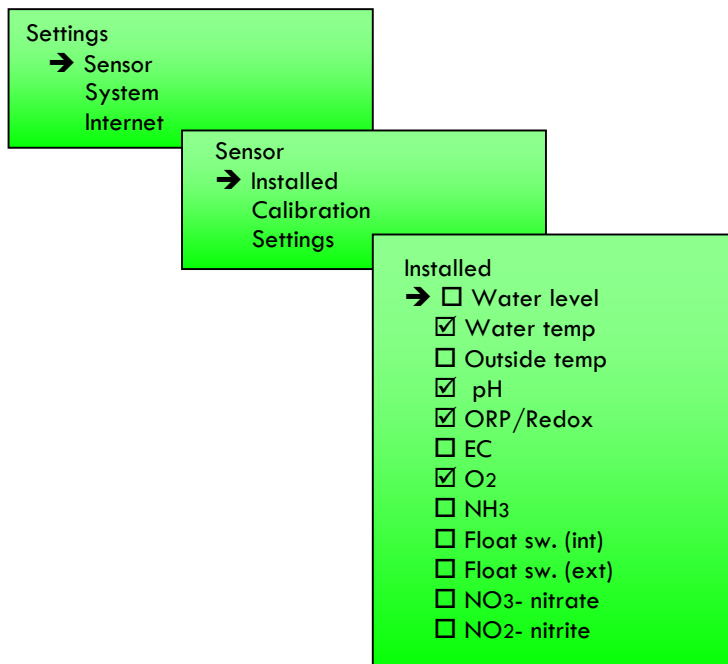
NOTE: Filter clean is only available when the Nexus automation from Evolution Aqua is installed.
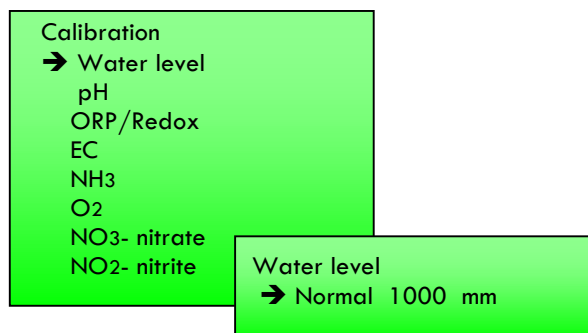
7.5 Settings

In the **Settings Menu** all settings can be edit or adjusted for all sensors, system and the internet.
The Koiguard system is default set to the Koiguard basic system.

7.5.1.1 Settings sensor _ installed

```
Settings
 ➔  Sensor
     System
     Internet
```

```
Sensor
 ➔  Installed
     Calibration
     Settings
```

```
Installed
 ➔  ☐ Water level
     ☑ Water temp
     ☐ Outside temp
     ☑  pH
     ☑ ORP/Redox
     ☐ EC
     ☑ O2
     ☐ NH3
     ☐ Float sw. (int)
     ☐ Float sw. (ext)
     ☐ NO3- nitrate
     ☐ NO2- nitrite
```

When a sensor is not installed, the sensor shows on the measurements screen only --.-- and no values.
It is also possible to switch the sensor off when the shown values are no longer valid when the sensor reaches the end of its lifetime.

7.5.1.2 Settings sensor _ calibration

```
Calibration
 ➔  Water level
      pH
     ORP/Redox
     EC
     NH3
     O2
     NO3- nitrate
     NO2- nitrite
```

```
Water level
 ➔  Normal  1000  mm
```

Adjust the water level till the correct value
is displayed.

De NH3 sensor which Koiguard is using only has to be calibrated the first time of use.

The Analogue display will show its true value,
The status display will show: safe, alert, alarm or Toxic.

```
NH3
➜  ☑ Analogue display
   ☐ Status display
   ☑ Gain (0.009 mg/l)
   ☐ Offset
   Adjust _.___ mg/l
      Reset
```

Take the new ammonium alert sensor out of its enclosure and place it into the sensor holder.
This procedure is completely explained in the manual of the ammonium sensor.

For all other explanation for the sensor calibration procedure, please reed chapter 7 of the Sensor controller manual.
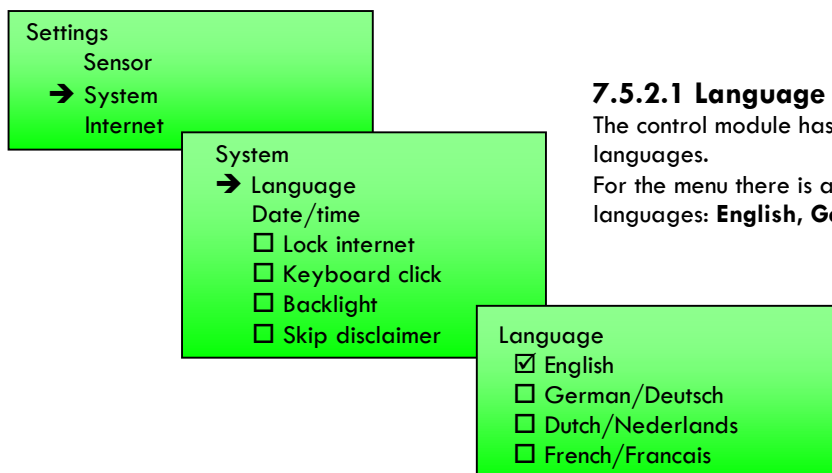
7.5.1.3 Sensor settings _ settings

```
Settings
➜ ☐ Auto disable
```

When Auto disable is selected ☑, the sensor will automatically been removed from the list when it's not installed. This means that the list of sensors is only showing the installed sensors.

7.5.2 Settings system
All one-time settings that have to be entered, can be entered in the **system settings**.

```
Settings
     Sensor
➜  System
     Internet
```

```
System
➜  Language
     Date/time
     ☐ Lock internet
     ☐ Keyboard click
     ☐ Backlight
     ☐ Skip disclaimer
```

```
Language
   ☑ English
   ☐ German/Deutsch
   ☐ Dutch/Nederlands
   ☐ French/Francais
```
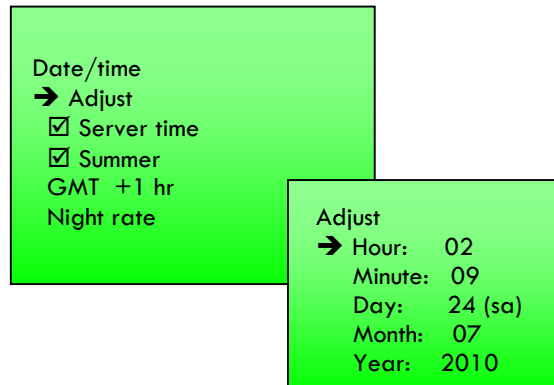
7.5.2.1 Language
The control module has already been preset in several languages.
For the menu there is a choice of the following languages: **English, German, Dutch and French**.

7.5.2.2 Date/time
When the control module is switched on, the correct time and date have to be entered. Select **Settings System <OK>** It is also possible to have time and date synchronized by the Koiguard Internet Computer (This is only possible if the Web server has been installed and connected to the Internet). To activate this, select **SERVER TIME**. To activate this option, the box must be checked and selected with the **<+>** switch.
To make sure the control module runs synchronistic with **Summer** (Daylight Saving(s)) Time, the box needs to be checked and selected with **<+>** switch. The system will now automatically adjust the time when the seasonal hours are being changed.
Manual setting of time and date can be done by moving the cursor with the "up" (4.3) or "down" (4.6) switch to the desired item. There is a choice of respectively: **HOURS / MINUTES / DAY / MONTH / YEAR**. In every item the actual time / date can be modified by adapting the values with the **<+>** or **<->** switch. When modifying the date, the system automatically changes the name of the corresponding day. The system time zone is set to GMT **+1 hour / CET.**

```
Date/time
➔ Adjust
   ☑ Server time
   ☑ Summer
   GMT  +1 hr
   Night rate
```

```
Adjust
➔ Hour:    02
   Minute:  09
   Day:    24 (sa)
   Month:   07
   Year:   2010
```

If it is possible to use a double electric power tariff, this can be indicated at the **NIGHT TARIFF <OK>** This setting is activated as default, if this needs to be modified, the position **APPLY** needs to be selected with the **<+>** switch. To make the system recognize the fact that the lower electric power tariff is also valid during the weekend, this can be indicated in **WEEKEND.** This is off as default, if this needs to be changed, the position in this menu needs to be selected with the **<+>** switch.

Here it is possible to indicate as from which moment in time this special power tariff is valid. The clock has been set for this on **start 23:00** hours and **end** at **7:00** hours as default. This can be modified by adapting the values with the **<+>** or **<->** switch.

```
Night rate
➔ ☐ Apply
   ☐ Weekend
   Start:  23:00 hr
   End:    07:00 hr
```
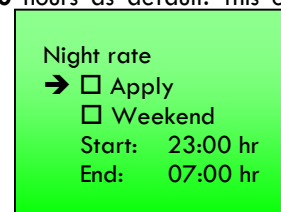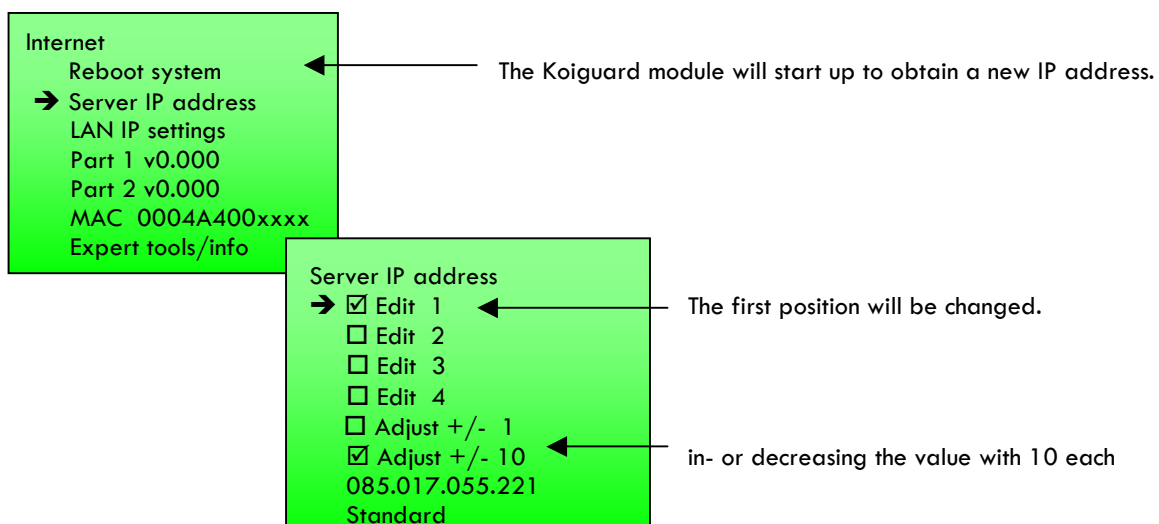
Lock internet: if selected it is not possible to control the system via the internet.
To allow other users or the dealer to change or adjust settings via the internet, the main user should provide the login code and password for the MyKoiGuard part on the internet site. The use of this function can be blocked by "lock internet".

Keyboard click: Each time a button is pressed a small beep is played.

Backlight: The backlight of the green display is illuminated for approximately 3 minutes after pressing a button. When the backlight is selected, the display is always illuminated.

7.5.3 Internet

All settings and tools needed for the connection between the Koiguard Main Controller and the internet or the private network, are explained in the chapter internet settings.

```
Internet
   Reboot system
➔ Server IP address
   LAN IP settings
   Part 1 v0.000
   Part 2 v0.000
   MAC  0004A400xxxx
   Expert tools/info
```

The Koiguard module will start up to obtain a new IP address.

```
Server IP address
➔ ☑ Edit  1
   ☐ Edit  2
   ☐ Edit  3
   ☐ Edit  4
   ☐ Adjust +/-  1
   ☑ Adjust +/- 10
   085.017.055.221
   Standard
```

The first position will be changed.

in- or decreasing the value with 10 each

7.5.3.1 Server IP address

It is possible to change the IP address of which the module will contact.
The current (WAN) IP address is shown on the screen and can be edit manual if needed.
The IP address is divided into 4 positions. Each position can be edit by selecting the position and to change the value with <-> or <+>. There is an option to do the in- or decreasing by each step 1 or 10.
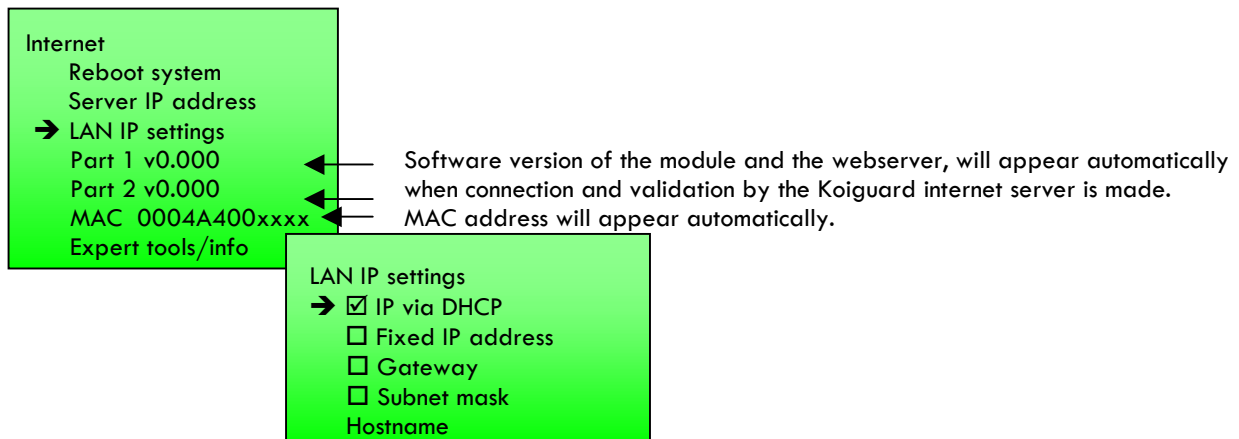The adjustments are changing real time on the screen.

7.5.3.2   Standard server IP address

In the memory of the Koiguard main module are default already 3 internet addresses for respectively **koiguard.nl**, **koiguard.com** and the **koiguard.de** server.
By choosing one or these addresses the module is communicating with the requested web page.
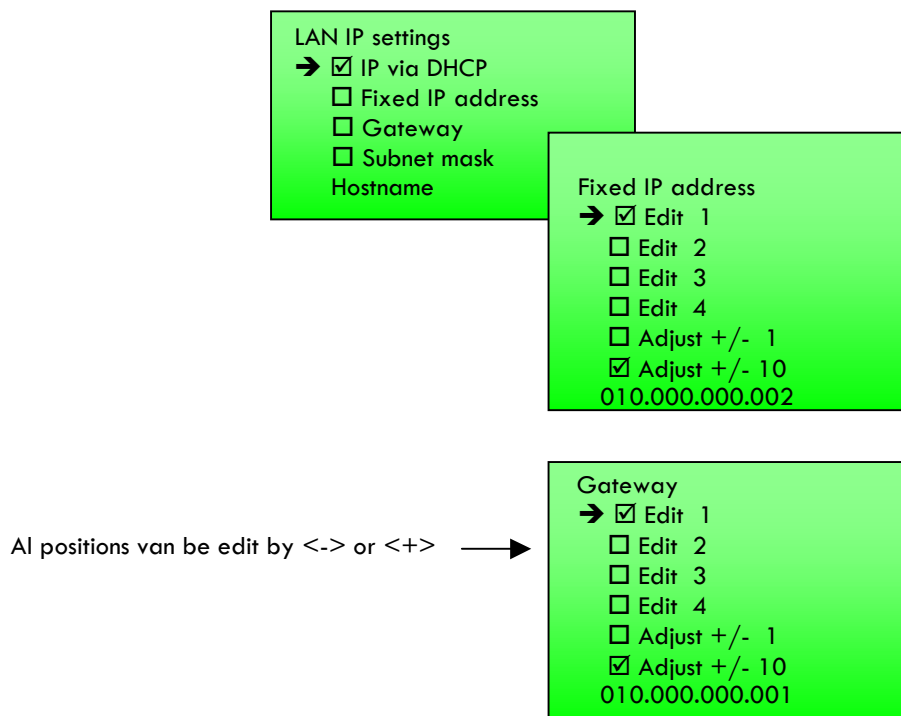After selecting it with the <ok> button, the change is made automatically.

7.5.3.3 LAN IP address

```
Internet
    Reboot system
    Server IP address
 ➜  LAN IP settings
    Part 1 v0.000    ◄───── Software version of the module and the webserver, will appear automatically
    Part 2 v0.000    ◄───── when connection and validation by the Koiguard internet server is made.
    MAC  0004A400xxxx ◄──── MAC address will appear automatically.
    Expert tools/info
```

```
LAN IP settings
 ➜  ☑ IP via DHCP
    ☐ Fixed IP address
    ☐ Gateway
    ☐ Subnet mask
    Hostname
```

Default the Koiguard main controller is set IP via DHCP. Via DHCP the module will obtain an IP address automatically.
Only for those situations wherewith this is not preferred, the LAN IP address can filled in manual.

7.5.3.4 Fixed IP address

```
LAN IP settings
 ➜  ☑ IP via DHCP
    ☐ Fixed IP address
    ☐ Gateway
    ☐ Subnet mask
    Hostname
```

```
Fixed IP address
 ➜  ☑ Edit  1
    ☐ Edit  2
    ☐ Edit  3
    ☐ Edit  4
    ☐ Adjust +/- 1
    ☑ Adjust +/- 10
    010.000.000.002
```

Al positions van be edit by <-> or <+> ────►

```
Gateway
 ➜  ☑ Edit  1
    ☐ Edit  2
    ☐ Edit  3
    ☐ Edit  4
    ☐ Adjust +/- 1
    ☑ Adjust +/- 10
    010.000.000.001
```

```
Subnet mask
➔ 255.255.255.000
```

```
Hostname
➔ http://koiguard
```

If more than one Koiguard system is connected to the same network, the hostname of the modules has to be changed. The hostname is the name which the module is using on the net.
It is not possible that modules have the same name.

Default the hostname is set to koiguard, changing the name with the <-> or <+> button will give

```
Hostname
➔ http://koiguard1
```

Using this hostname in the browser of your computer will give all the network information of the Koiguard system.
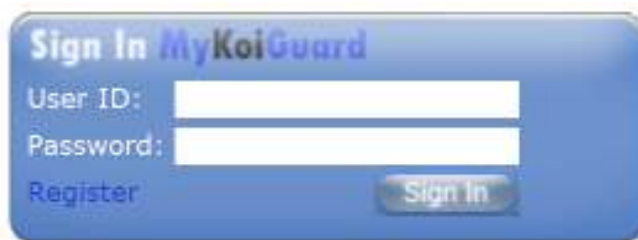
```
Internet
    Reboot system
    Server IP address
    LAN IP settings
    Part 1 v0.000
    Part 2 v0.000
    MAC  0004A400xxxx
➔ Expert tools/info        ◄──────────  The section **Expert tools/info** is no part of this manual.
```

8. Register on the internet

Before the KoiGuard control module can be connected to the internet, the module needs to be registered (once) on the KoiGuard internet site. To register the module, you need to enter the MAC address of your internet/GSM module as well as the unique product code that has been attached with the delivery/purchase of this product. After the registration has been checked and approved by the Koiguard computer the module will be activated on the internet environment.

Step 1： go to www.koiguard.com on your internet browser
Step 2： If you are a registered user already, go to **step 7**, if you are a new user, go to **step 3**.

Step 3： Select **Register** <ENTER> →

Step 4 : Fill out the complete table and select

USERNAME:	*	← Enter your personal username here
PASSWORD:	*	← Enter your unique password here
PASSWORD:	re-type *	← Enter your password again
NAME:	*	← Enter your personal data here
FAMILY NAME:		
STREET:		
NUMBER:		
POSTAL CODE:		
CITY:		
E-MAIL:	(for alerts)*	← Fill out your e-mail address here, necessary to be able to receive the login code.
TELEPHONE NR:		
MOBILE NR:	(for alerts, in format +31612345678)	
FAX NR:		

Step 5 : An e-mail is sent to the e-mail address filled out earlier.
In this e-mail you'll find an internet link. Copy this link in the address bar of your internet browser or double click on the link.
It may take a couple of minutes before this e-mail is received.

INFORMATION

Thank you for registering, an activation e-mail has been sent to the e-mail address you entered. This will contain a link that you need to copy into the address line of your browser to activate your account

Step 6: When the e-mail has been received, the registration has been successful and you can log-in as user.

Step 7 : Log in

Enter at User ID your personal username
Enter your unique password

Select Sign in
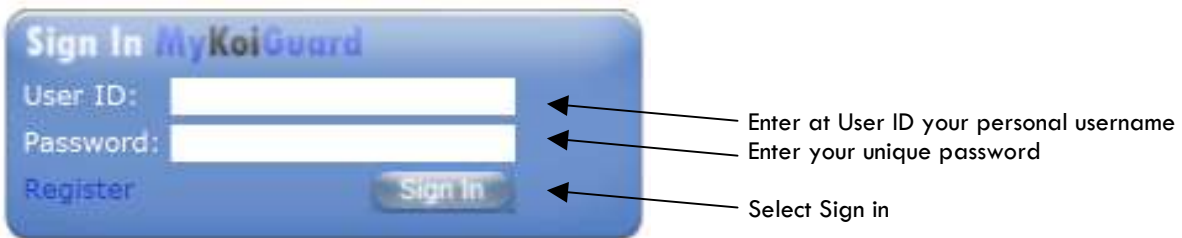
9. Using MyKoiGuard

To add your koiguard system to your MyKoiGuard environment, please go to the configuration page
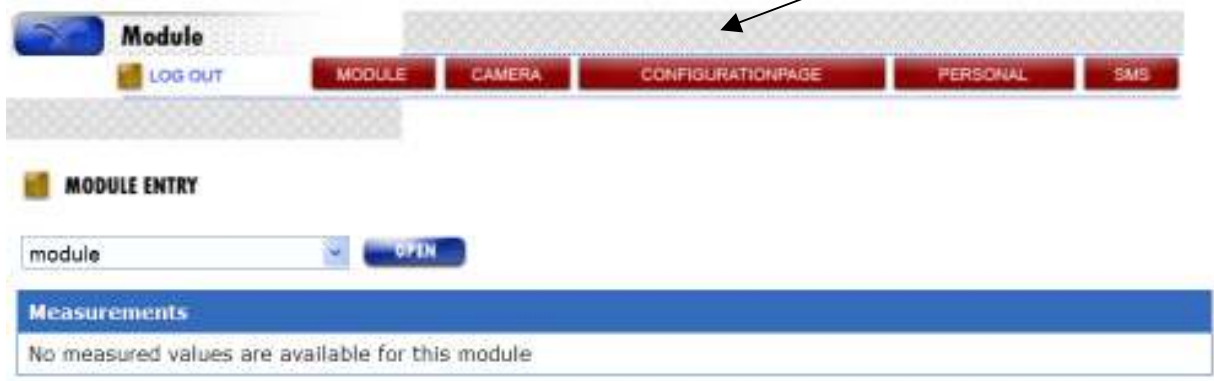
9.1 Add a module or a camera

Module ID:	Enter the MAC address, see side of module
Activation code:	Enter Code, see attached UNIQUE YELLOW sheet
Name:	Possibility to enter a module name
Cameras:	Choose which camera to change
Name:	Possibility to enter a camera name
Type:	Select the model of the camera installed

9.1.1 Add a module

When using the Koiguard module for the first time, or when an extra Koiguard system is installed the module must be added to the own MyKoiguard environment.
Please fill in on the form ADD MODULE on the item Module ID the number witch is shown on the enclosed yellow paper. Next the Activation code must filled in, then press SAVE.

9.1.2 Edit a module

The module can be provided with a name in stead of only a serial MAC number.
This can be very useful when using several modules.
Select the desired module and fill in a name, then press SAVE.

9.1.3 Add a camera

To Add a camera to the Koiguard system, fill in the name of the camera on the first line.
It is useful to have use a name for the camera if several camera's are connected.
After that the type / model of the camera must be selected by using the right blue drop down arrow.
For the operation of the camera with the internet, the camera must have an IP Address.
Only when the use of a static IP address is requested choose "Not attached", otherwise select the module which will be used nearby the camera.
This static IP address is necessary when the IP address is changing, or when the network doesn't support DHCP.
Only when using the static IP address, fill in the LAN IP of the camera.

For access of the camera true the internet it is necessary to fill in the port number which is set in the router, for using port forwarding.

For more technical information about this matter, we direct you to the camera's manual.

9.1.4 Edit a camera

It is possible to change the settings of the camera.
Select the camera which must be edit, by moving to the first line and choose the camera.
Do the changing and press SAVE.

When a camera must be deleted from the list, select the camera which must be deleted by moving to the first line and choose the camera.
Then press DELETE

9.1.5 Screensaver

When the screensaver is activated, after the selected period of time (default 1 minute), a Koiguard screen saver will appear on the computer screen.
The text can be edit.

9.2 Measurements

When using the Koiguard system for the first time with the internet, the current measurements of the connected sensors will appear after a few minutes on the screen.
Before of that the measurement bar shows :*"No measured values are available for this module"*

After approximately 24 hours the internet connection is made, the graphic are ready to show.

fig5 Measurements

(5.1)   Name of the Koiguard module to select
(5.2)   Name of the sensor or device to show
(5.3)   Shows the last time an update of the module is made.
          This is a tool to check if there is still an internet connection with the module
(5.4)   Show the last updated actual measurement of the selected sensor of device
(5.5)   To change the limits of the graphic for manual scaling the Y-axis top, after change press APPLY
(5.6)   To change the limits of the graphic for manual scaling the Y-axis bottom, after change press APPLY
(5.7)   To download all the raw data stored at the Koiguard internet server.
          A .csv file is generated and can be showed and edit with Microsoft Excel.
(5.8)   If set a screensaver will start after the elapsed time. Pushing the Start Now button will start the
          screensaver immediately.
(5.9)   With the buttons Day – Week – Month – 3Months – 6 Months – Year the time scale of the measurement
          graphic can be adjusted. When the scale is out of limit the next error message appears:
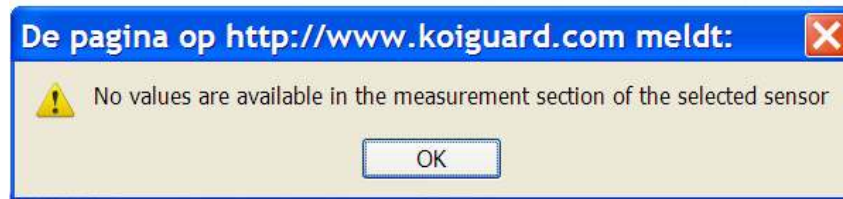
(5.10)   Graphic of the measurements of the selected sensor or device.
          The values of the graph are interpolated to generate a readable printout.

9.3 Alarm settings

All settings regarding the alarm can be made on the main module itself, as well as on the Mykoiguard internet page. All settings and adjustments can be made via the internet.
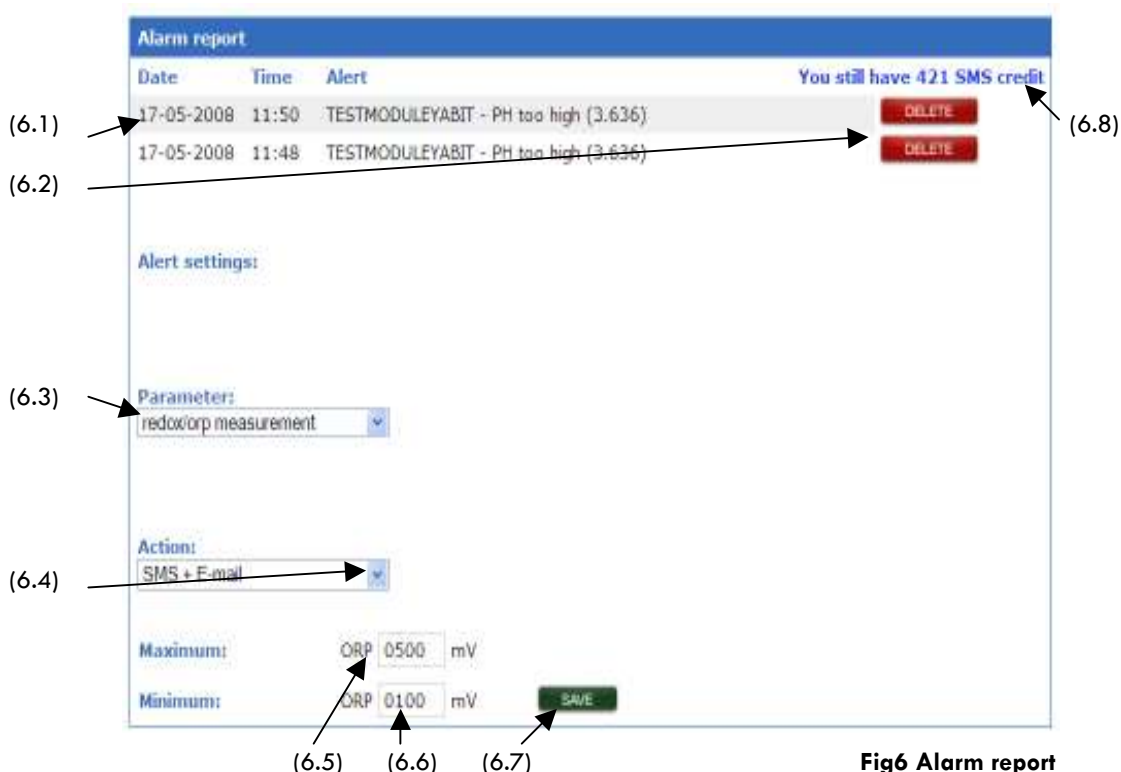

Fig6 Alarm report

(6.1)   Alarm message, with date, time, to which sensor it is, and the reason of the alarm.
(6.2)   When selecting the DELETE button, the shown alarm report will be deleted from the line and
        Its memory.
(6.3)   Settings for the alarm can be made for each sensor or activator.
        Selecting the drop down menu shows all the sensors and activators available.
        The settings are made for these sensor which is highlighted in the dropdown menu.
(6.4)   For each individual sensor the action after an error occurs can be set.
        Ignore   -   Nothing happens
        Report only   -   an alarm report is shown on the display and on the Mykoiguard site
        SMS   -   An alarm SMS will be send to the given phone number *
        E-Mail   -   An alarm e-mail will be send to the given e-mail address

        *NOTE   -   there is only one SMS sent when there is sufficient credit.
                             See 6.8 SMS credit
(6.5)   The maximum allowable level of the sensor, before an alarm is generated.
(6.6)   The minimum allowable level of the sensor, before an alarm is generated.
(6.7)   After changing the settings, please confirm with selecting SAVE.
(6.8)   Actual number of available SMS credits.
        When selecting this line, a new screen appears with option of buying SMS credits.
        A SMS alarm message is only send if the SMS credits are not exhausted.
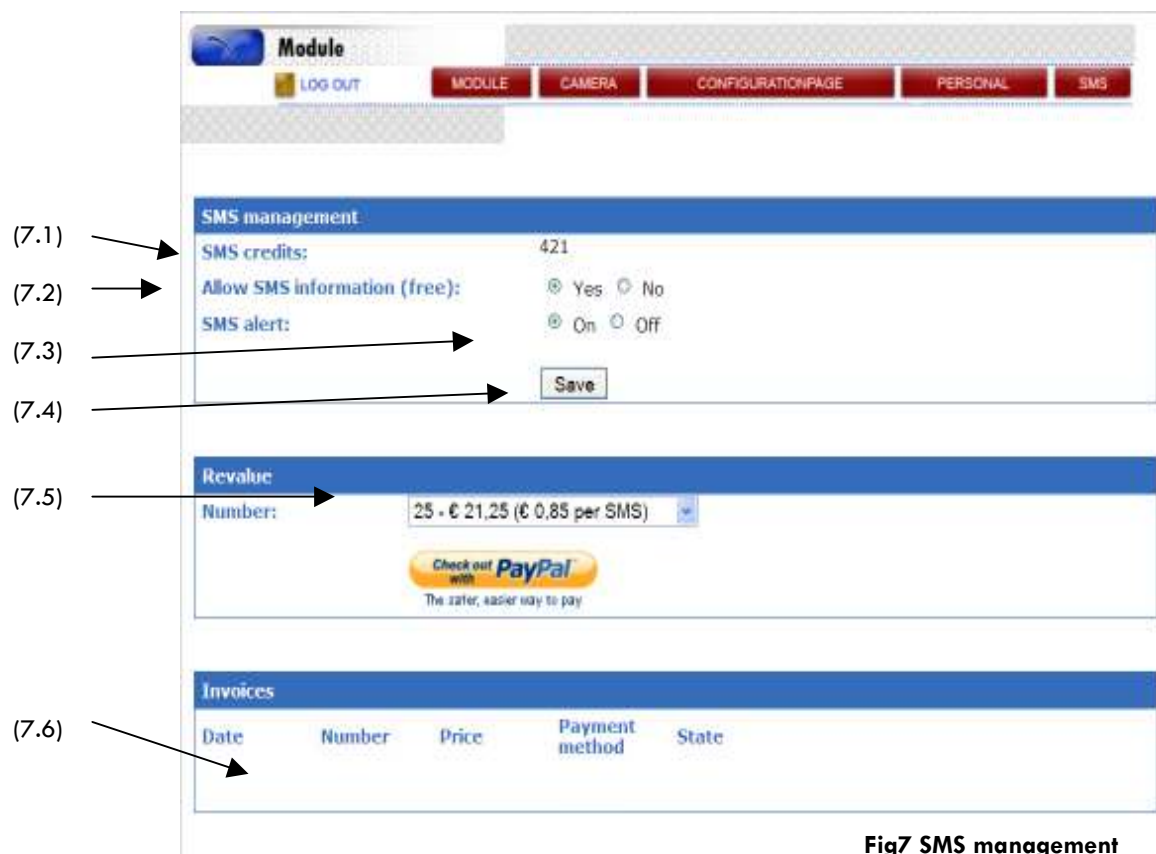
Fig7 SMS management

7.1   Number of actual SMS credits
7.2   Option for free SMS information from the Koiguard company
7.3   SMS alert on or off.
       If switched off, no SMS is send when an error occurs.
       This can be useful during maintenance, or when a sensor is giving no longer valid measurements caused
       by an expired lifetime.
7.4   After changing the settings, select Save.
7.5   In this dropdown is the number of SMS that will be purchased.
       The payment will be made with Paypal.
7.6   The invoice for the purchased SMS will be placed here in a pdf format.

9.4 Controls

All settings regarding the control of the installed equipment of devices can be made on the main module itself, as well as on the Mykoiguard internet page. All settings and adjustments can be made via the internet.
There is a difference between the method of control on some devices.
The main difference will be that some devices only can be switched on or off, while others are more controllable due to some limits.

Controls		
ozone generator		(8.1)
Controls:	Off SAVE	(8.2)
Current settings:	**Off**	(8.3)
Current state:	**Off (21-07-2010 18:02:51)**	(8.4)
Maximum:	0400 mV SAVE	(8.5)
Current maximum:	**0400**	
Minimum:	0300 mV SAVE	
Current minimum:	**0300**	

Fig8 Controls

8.1   The selected device
8.2   To change the current state, it is possible to change the state to ON – OFF - AUTOMATIC
     If the setting is changed, press SAVE.
8.3   After SAVE is selected, the current setting will be changed into the requested setting.
     Now the internet server is connecting to the Koiguard module to make the changes.
8.4   When the connection is made, the current state will change automatically into its requested state.
     Note, this can take up to several minutes.
8.5   Some devices can be controlled by adjustable levels.
     The current maximum and minimum are the settings in the memory of the Koiguard controller. If new levels are requested, these can be changed by the line Maximum or Minimum and then select the associated SAVE button. Then will the current maximum and minimum levels change into the requested levels.

Note: **These changes can switch off major appliances nearby the pond.**

9.5 Scheduler

With the use of the scheduler it is possible to let the Koiguard system control the equipment and devices using the timetable.
Devices like the fish feeder dispenser can be controlled automatically by the timetable, or manually switched on off permanently.
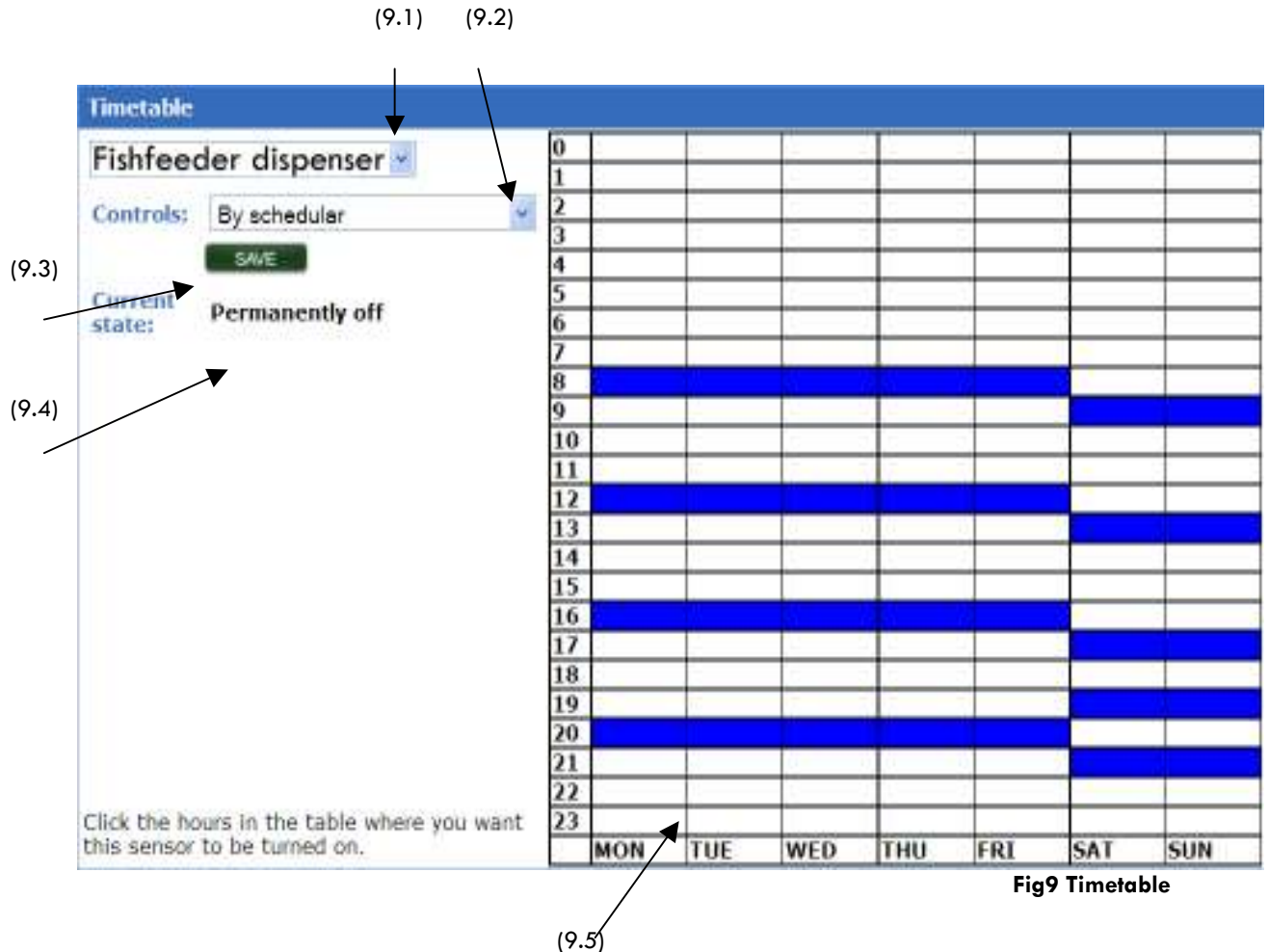
(9.1)   (9.2)

Fig9 Timetable

(9.5)

9.1   Selected device, changeable by clicking on the drop down menu.
9.2   Possibility to modify the current control option to : By scheduler
                                                    Permanently on
                                                    Permanently off

9.3   After changing the control, please confirm by selecting SAVE.
9.4   Shows the current state of the Koiguard control. Changes made with Mykoiguard can take several minutes.
9.5   With the left mouse button each cell can be selected. A blue cell means that the corresponding action for the device is selected. For example at Monday morning at 8:00 am the Fish feeder is getting a start pulse. The length of the start pulse is a setting which has to be made at the module itself, but can be modified from 1 – 120 seconds. (see chapter 7.4)

10. Preservation

- This product is exclusively meant to be used indoors or in outdoor spaces covered from rain.
- Do not use the product immediately after bringing it from a cold into a warm space. The water from condensation can destroy the device under certain circumstances! Take some time to allow the device to assume the temperature of the environment, before using it. This can possibly take several hours.
- The switch socket and the plug of the device to be connected must never be touched with moist or wet hands.
- Please make sure that the insulation of the entire product is not damaged or destroyed. Check the product for damages each time before it is used.

If the product is damaged it is NOT allowed to connect it on mains voltage! Highly dangerous!

If the product will not be used for a prolonged period of time, it must be disconnect from mains voltage.

Avoid unfavorable environmental conditions during transport and on the location of use:
- Wetness and an high level of atmospheric humidity
- extreme high or low temperatures
- dust or inflammable gasses, fumes or solvents
- strong vibrations
- strong magnetic fields, like near engines or loudspeakers

11. Maintenance and cleaning

The product is free of maintenance. Clean the control module with a soft, clean, dry and non-fluffy cloth. To remove stronger filthiness the cloth can be moistened with lukewarm water. Under no circumstances should aggressive detergents or chemical solvents be used, because these could damage the surface of the casing and the letterings. After cleaning make sure the control module is completely dry before plugging the device back in the socket.

12. Removal

Remove the no longer to be used device according to the applicable statutory regulations.

13. Declaration of Conformity (DOC)

DECLARATION OF CONFORMITY

R & TTED 99 / 5 / EEC
EMC directive 89/336/EEC

CE   0700

:   Koiguard
Report number : 06C00765RPT01
Licence Holder: Koiguard BV

Address: De Hoek 42
                 NL-1601MR Enkhuizen (The Netherlands)

We declare on our own responsibility, that the product:

Kind of product: KoiGuard KG-MC100

Is in compliance with the following norm(s) and documents:
          EN 50081 – 1 : 1992
          EN 50082 – 1 : 1997
          EN 61000-3-3 (1995)+A1(2001)
          EN 61000-6-3(2001+A11(2004)
          EN 61000-3-2 (2000)
          EN 61000-6-2 (2001)

Enkhuizen, 16 september 2006

Manufacturer / Authorised representative,

M.G.B. Stroet Managing Director